

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 14

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* ROGER R. LESIEUR

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Appeal No. 2002-0218  
Application No. 09/332,415

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ON BRIEF

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Before PAK, WARREN, and DELMENDO, *Administrative Patent Judges*.  
PAK, *Administrative Patent Judge*.

*DECISION ON APPEAL*

This is a decision on an appeal under 35 U.S.C. § 134 from the final rejection of claims 1, 2, 7, 9, 12 through 20, 22, and 23, which are all of the claims pending in the application. Claims 3-6, 8, 10, 11, and 21 have been canceled.

*APPEALED SUBJECT MATTER*

The subject matter on appeal is related to the subject matter of another appeal, Appeal No. 2002-0249 (Application 09/321,390). This subject matter, like the previous subject matter, is directed to autothermal reformer assemblies. Compare

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the claims on present appeal with the appealed claims in Appeal No. 2002-0249. One of the novel aspects of the autothermal reformer assemblies involved in the two appeals lies in employing "an open cell foam catalyst bed that reduces the size and weight of the reformer assembly." Compare page 1 of the present specification with page 1 of the specification of Application 09/321,390. This open cell foam catalyst bed is also said to provide "an enhanced catalyst and heat transfer surface area . . . and . . . an enhanced gas mixing and distribution flow path." Compare page 3 of the present specification, with page 3 of the specification of Application 09/321,390. However, the autothermal reformer assembly in this appeal, unlike the previous one, is directed to converting methanol and ethanol fuels, rather than hydrocarbon fuels (claim 23) and employing a copper and/or zinc catalyst bed subsequent a noble catalyst bed (claims 1, 20 and 22). Details of the appealed subject matter are illustrated in representative claims 1, 13, 18, and 23 which are reproduced below<sup>1</sup>:

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<sup>1</sup> The appellant has indicated (Brief, page 3) that claims 1, 2, 7, 9, 12, 16, 17, 19, 20 and 22 will stand or fall together, claims 13-15 will stand or fall together, and claims 23 and 18 stand or fall separately. Therefore, for purposes of this appeal, we limit our discussion to claims 1, 13, 18 and 23 consistent with 37 CFR § 1.192(c)(7)(2001). See *In re McDaniel*, 293 F.3d 1379, 1383, 63 USPQ2d 1462, 1465 (Fed. Cir. 2002) ("If

1. A methanol and ethanol fuel gas autothermal reformer assembly for converting a methanol or ethanol fuel gas stream into a hydrogen-enriched process gas stream, said assembly comprising:
  - a) a monolithic open cell foam catalyst bed, said catalyst bed including an inlet end and an outlet end, a first inlet region of said catalyst bed being provided with a catalyst which is operable to combust a portion of the fuel gas stream so as to raise the temperature of said fuel gas stream in said first region to a temperature in the range of about 300° to about 500°F while inhibiting carbon deposition in catalyzed cells of said foam catalyst bed, and said catalyst bed further including a subsequent second region which contains a copper and/or zinc catalyst;
  - b) a fuel gas stream inlet passage, said fuel gas stream inlet passage being disposed in heat exchange relationship with a process gas stream outlet passage from said catalyst bed whereby heat from the process gas stream is transferred to said fuel gas stream inlet passage from the processed gas stream;
  - c) an air inlet passage, said air inlet passage being disposed in heat exchange relationship with the process gas stream whereby heat from the process gas stream is transferred to said air inlet passage; and
  - d) a fuel gas stream reforming catalyst deposited in said foam catalyst bed.

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the brief fails to meet either requirement [of 37 CFR § 1.192 (c)(7)(2001)] the Board is free to select a single claim from each group of claims subject to a common ground of rejection as representative of all claims in that group and to decide the appeal of that rejection based solely on the selected representative claim").

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13. The autothermal reformer assembly of Claim 1 wherein said foam catalyst bed includes an autothermal reformer-operating temperature-compatible metal support selected from the group consisting of stainless steel, nickel alloys and iron-aluminum alloys.

18. The autothermal reformer assembly of Claim 1 wherein said air inlet passage contains an air/steam mixture.

23. A methanol fuel gas autothermal reformer assembly for converting a methanol fuel gas stream into a hydrogen-enriched process gas stream, said assembly comprising a monolithic open cell foam catalyst bed, said catalyst bed including an inlet end and an outlet end, an inlet portion of said catalyst bed being provided with a noble metal catalyst which is operable to combust a portion of the methanol fuel gas at a temperature of about 200°F thereby enabling start up of the reformer assembly while inhibiting carbon deposition in catalyzed cells of said foam catalyst bed.

*PRIOR ART*

In rejecting the claims under 35 U.S.C. § 103, the examiner relies upon the following prior art references:

Dicks	3,904,554	Sep. 09, 1975
Narumiya et al. (Narumiya)	4,308,233	Dec. 29, 1981
Setzer et al. (Setzer)	4,415,484	Nov. 15, 1983
Sheller	5,384,009	Jan. 24, 1995
Bhattacharyya et al. (Bhatta)	5,498,370	Mar. 12, 1996
Clawson	WO 98/08771	Mar. 05, 1998
(Published World Intell. Prop. Org. Application)		

*REJECTIONS*

The appealed claims stand rejected as follows<sup>2</sup>:

I. Claims 1, 2, 7, 9, 12-18, 20, and 22 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 22 of copending Application Serial No. 09/321,390 in view of Dicks;

II. Claims 19 and 23 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 22 of copending Application Serial No. 09/321,390 in view of Dicks and Clawson;

III. Claim 23 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya and Setzer;

IV. Claims 1, 2, 7, 9, 12, 16, 17, 19, 20, and 22 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, Setzer and Dicks;

V. Claims 13-15 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, Setzer, Dicks and Sheller; and

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<sup>2</sup> The examiner has withdrawn the Section 112 rejection set forth in the final Office action dated December 27, 2000. See the Answer, pages 2, 3 and 5.

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VI. Claim 18 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, Setzer, Dicks, and Bhatta.

*OPINION*

We have carefully reviewed the claims, specification and prior art, including all of the arguments advanced by both the examiner and the appellant in support of their respective positions. As a consequence of this review, we have made the determinations which follow.

*OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTIONS*

The examiner has provisionally rejected claims 1, 2, 7, 9, 12-20, 22 and 23 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 22 of copending Application Serial No. 09/321,390 in view of either Dicks or Dicks and Clawson. The appellant has not challenged the examiner's factual findings and conclusions supporting the obviousness-type double patenting rejections in question. Rather, the appellant asserts that (Brief, page 16):

These rejections will not be addressed in this appeal brief since they are not ripe for resolution at this point in time.

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According to the appellant (Reply Brief, page 1),

it is impossible to have a provisional **final** obviousness-type double patenting rejection which relies on a co-pending patent application which has not yet issued . . . .<sup>3</sup>

We do not agree. Our reviewing courts have sanctioned and reviewed provisional double patenting rejections based upon claims in a copending application. *See, e.g., In re Longi*, 759 F.2d 887, 892, 225 USPQ 645, 648 (Fed. Cir. 1985) (double patenting rejection over claims of three copending applications affirmed on the merits); *In re Mott*, 539 F.2d 1291, 1296, 190 USPQ 536, 541 (CCPA 1976) (double patenting rejection under 37 CFR § 101 over claims in a copending application was held correct on the merits but reversed because rejection was made final rather than provisional); *In re Wetterau*, 356 F.2d 556, 558, 148 USPQ 499, 501 (CCPA 1966) (affirming provisional double patenting rejection over claims in a copending application on the merits). Therefore, it is our determination that the final provisional obviousness-type double patenting rejections in question are properly before us. However, the appellant has not disputed the factual findings and conclusions set forth by the examiner.

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<sup>3</sup> We note that a decision affirming-in-part and reversing-in-part the examiner's rejections of the claims in copending Application Serial No. 09/321,390 was mailed in May, 2003.

Accordingly, we are constrained to summarily affirm the examiner's decision provisionally rejecting claims 1, 2, 7, 9, 12 through 20, 22 and 23 under the judicially created doctrine of obviousness-type double patenting.

*35 U.S.C. § 103*

Under 35 U.S.C. § 103, to establish a *prima facie* case of obviousness, there must be some objective teachings or suggestions in the applied prior art references<sup>4</sup> and/or knowledge generally available to a person having ordinary skill in the art that would have led such person to arrive at the claimed subject matter. *See generally In re Oetiker*, 977 F.2d 1443, 1447-48, 24 USPQ2d 1443, 1446-47 (Fed. Cir. 1992) (*Nies, J., concurring*); *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). The knowledge generally available to a person having ordinary skill in the art would include the appellant's admission regarding what was known in the art at the time of the appellant's invention. *See In re Nomiya*, 509 F.2d 566, 570-71, 184 USPQ 607, 611-12 (CCPA 1975) (the admitted prior art in an applicant's specification may be used in determining the

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<sup>4</sup> In evaluating the prior art references, it is proper to take into account not only the specific teachings therein, but also the inferences which one skilled in the art would reasonably be expected to draw therefrom. *See In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).



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patentability of a claimed invention); accord *In re Davis*, 305 F.2d 501, 503, 134 USPQ 256, 258 (CCPA 1962).

*CLAIM 23*

With the above precedents in mind, we turn first to the rejection of Claim 23 under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, and Setzer. We observe that the appellant does not dispute the examiner's finding that Clawson discloses an autothermal reformer assembly useful for converting alcohol (methanol and ethanol) fuels corresponding to the claimed autothermal reformer assembly except that its reforming catalyst is not supported by an open cell foam carrier (support). Compare the Answer, pages 5-6, with the Brief, pages 18-20

The dispositive question is, therefore, whether it would have been obvious to employ an open cell foam carrier to support the reforming catalyst of the autothermal reformer assembly described in Clawson. On this record, we answer this question in the affirmative.

We find that Clawson teaches that its reforming catalytic materials, such as noble metals, can be supported on any carrier and that the resulting reforming catalytic bed needs to be sufficiently porous to allow the passage of gases. See page 16,

line 23 to page 17, line 7; page 19, line 29 to page 20, line 7; and page 22, line 20 to page 23, line 2. We recognize that Clawson does not specifically mention using an open cell foam carrier as the carrier for its reforming catalyst.

However, we observe that it is admittedly known to be desirable to reduce the size and weight of an autothermal reforming assembly by focusing on the shapes and/or configurations of reforming catalysts (inclusive of an inert carrier which determines the catalyst shape or configuration). See the specification, pages 2-3. We find that Narumiya teaches an open cell foam carrier, which can be used with a reforming catalytic material, such as a noble metal catalyst, and can be used to reduce the weight and size of a purification device (a small purification device for an exhaust gas). See column 2, lines 45-65, column 3, lines 15-46 and column 4, lines 27-49. We find that this open cell foam carrier also has properties useful for and advantageous to the reforming zone of the autothermal reformer assembly, such as decreasing pressure loss and improving high heat resistance, small heat capacity, unreacted gas conversion and porosity. See column 1, lines 40-47 and column 2, lines 35-44.

Given the desire of one of ordinary skill in the art to reduce the size and weight of an autothermal reformer assembly, we concur with the examiner that one of ordinary skill in the art would have been led to employ the open cell foam catalyst carrier taught in Narumiya as the carrier for the reforming catalyst of the autothermal reformer assembly described in Clawson, motivated by a reasonable expectation of successfully reducing the size and weight of the assembly and enhancing the heat transfer, gas mixing and distribution, and gas conversion during the autothermal reforming process. See, e.g., *Nomiya*, 509 F.2d at 572, 184 USPQ at 613 ("that knowledge of a problem provides a reason or motivation for workers in the art . . .").

In reaching this determination, we recognize that Narumiya is directed to employing its open cell foam catalyst carrier in a purification device, rather than in a reforming zone of an autothermal reformer assembly, as argued by the appellant. However, as indicated *supra*, the appellant acknowledges that it is known to be desirable in the autothermal reforming art to reduce the size and weight of an autothermal reformer assembly via selecting particular catalyst shapes and/or configurations. We find that Narumiya is also interested in decreasing the size and the weight of a purification device by employing a

particularly shaped or configured catalytic carrier (thus forming a particularly shaped or configured catalyst). Therefore, from our perspective, one of ordinary skill in the art interested in reducing the size and weight of an autothermal reformer assembly would have looked to the teachings of Narumiya to accomplish the same. See, e.g., *In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174 (CCPA 1979) (a prior art reference is considered from an analogous art if it is reasonably pertinent to the particular problem with which the inventors were involved); *Nomiya*, 509 F.2d at 572, 184 USPQ at 613 ("knowledge of a problem provides a reason or motivation for workers in the art . . . "). This is especially true in this situation since Naurmiya teaches that its open cell foam carrier can also be used together with a reforming catalytic material, such as a noble metal, and has properties appropriate and advantageous to the reforming zone of the autothermal reforming assembly of the type described in Clawson as indicated *supra*.

Accordingly, we affirm the examiner's decision rejecting claim 23 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of Clawson, Narumiya and Setzer<sup>5</sup>.

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<sup>5</sup> Setzer is deemed cumulative and redundant since Clawson teaches employing a reforming catalyst, such as a noble metal, on any carrier. See Clawson, page 16.

*CLAIMS 1, 2, 7, 9, 12, 16, 17, 19, 20, and 22*

We turn next to the examiner's rejection of claims 1, 2, 7, 9, 12, 16, 17, 19, 20, and 22 under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, Setzer and Dicks. Much of the relevant disclosures of Clawson and Narumiya are discussed above. We find nothing in Setzer and Dicks which teaches or would have suggested the employment of a copper and/or zinc catalyst bed **subsequent to** a noble metal catalyst bed in the autothermal reformer assembly of the type suggested by Clawson and Narumiya. Nor has the examiner explained why one of ordinary skill in the art would have been led to employ the above-mentioned catalysts in the claimed sequence. Accordingly, we reverse this rejection.

*CLAIMS 13 THROUGH 15*

We turn next to the examiner's rejection of claims 13-15 under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, Setzer, Dicks and Sheller. However, since the examiner does not rely on Sheller to remedy the above deficiency, we reverse this rejection as well.

*CLAIM 18*

We turn next to the examiner's rejection of claim 18 under 35 U.S.C. § 103 as being unpatentable over the combined

disclosures of Clawson, Narumiya, Setzer, Dicks and Bhatta. As the examiner does not rely on Bhatta to remedy the above deficiency indicated *supra*, we reverse this rejection as well.

#### CONCLUSION

The provisional rejection of claims 1, 2, 7, 9, 12-18, 20, and 22 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-22 of copending Application Serial No. 09/321,390 in view of Dicks is affirmed.

The provisional rejection of Claims 19 and 23 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-22 of copending Application Serial No. 09/321,390 in view of Dicks and Clawson is affirmed.

The rejection of Claim 23 under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya and Setzer is affirmed.

The rejection of Claims 1, 2, 7, 9, 12, 16, 17, 19, 20, and 22 under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, Setzer, and Dicks is reversed.

The rejection of claims 13-15 under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, Setzer, Dicks, and Sheller is reversed.

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The rejection of claim 18 under 35 U.S.C. § 103 as being unpatentable over the combined disclosures of Clawson, Narumiya, Setzer, Dicks, and Bhatta is reversed.

*TIME PERIOD FOR RESPONSE*

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

*AFFIRMED*

CHUNG K. PAK	)	
Administrative Patent Judge	)	
	)	
	)	
	)	BOARD OF PATENT
CHARLES F. WARREN	)	APPEALS AND
Administrative Patent Judge	)	INTERFERENCES
	)	
	)	
	)	
ROMULO H. DELMENDO	)	
Administrative Patent Judge	)	

CKP:hh

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